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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/547,663	04/12/2000	EMI TAKABAYASHI	A-355	6241

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EXAMINER	
CHANG, AUDREY Y	
ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/547,663	TAKABAYASHI ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-16* is/are rejected.

7)☒ Claim(s) *1-3,5,6 and 17-19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on June 24, 2004, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, 5-7, and 14, and has newly added claim 19.
- Claims 1-3, and 5-19 remain pending in this application.
- The rejections to claims 1-3, 5-7, 14 and 17-18 under 35 USC 112, first paragraph, for newly added matters set forth in the previous Office Action are withdrawn in response to applicant's amendment.
- The rejection to claim 10 under 35 USC 112, first paragraph, set forth in the previous Office Action is withdrawn in response to applicant's argument.
- The rejections to claims 7 and 14 under 35 USC 112, second paragraph, set forth in the previous Office Action are withdrawn in response to applicant's amendment.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 7 is rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 has been amended to recite the phrase "a color hologram display comprising a combined reflection and volume type of single layer or multilayer, wherein a color pattern of plane characters or images and color three-dimensional subject image are reconstructably recorded while spatially superposed one upon another" that is confusing and indefinite for the reasons stated below.

Firstly, it is not clear what is considered to be a *combined* reflection and volume type of *single layer or multilayer*". What is considered to be *reflection type* of a layer or multilayer? And what is considered to be *volume type* of layer or multilayer? Then what is considered to be the *combined* reflection and volume type? The applicant is respectfully noted, a layer simply will not have these characters. In general a hologram may be either of *reflection* mode or *transmission* mode. A hologram may also be recorded as *thin* hologram or *volume* hologram. So it is possible to have a "**reflection type volume hologram**". But not a layer or multilayer. Secondly, the claim fails to give a *structural* and *logical* relationship between the layer or multilayer and the reconstructably recorded color pattern and color three-dimensional image which therefore makes the claim incomplete.

Claim Objections

3. Claim 19 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot dependent from more than one claim. See MPEP § 608.01(n). Accordingly, the claim 19 is not been further treated on the merits.

4. **Claims 1-3, 5-6 and 17-18 are objected to because of the following informalities**:

(1). **Claim 1 has been amended** to include the phrase "a plane shadow of said color pattern of plane characters or image is reconstructed at a surface or image plane different from the image plane of the reconstructed color pattern". It is not clear if this **difference** in **reconstruction image planes** of the color pattern of plane characters and its plane shadow is or is not same as the feature "a reconstructed image of the plane pattern differs depending on height from the hologram surface" as recited in earlier part of the claim. The specification *does not* teach the reconstructed image of the color pattern of the plane character to be different as viewed at different height from the holographic display surface, but does disclose that the color pattern of plane characters and *its plane shadow* are reconstructed at *different*

image plane with respect to the holographic display surface. Clarifications and logical connections are required to give a definite scope for the claim.

(2). The phrase "a shadow" recited in claim 17 is vague and indefinite since it is not clear how does this shadow relate to the plane shadow recited in its based claim. Also the phrase "is reconstructably recorded on the surface of a color three-dimensional subject image" recited in claim 17 is wrong since (1) it is not sure if the three-dimensional subject image is the reconstructed image from the recorded hologram or not, and (2) it is **impossible** to recorded shadow image on an image. They have to be recorded within the photosensitive recording medium but the **reconstructed** images can be designed to be at different spatial locations. *This rejection has already been presented in the previous Office Action yet the applicant fails to respond.*

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Waitts (PN. 5,956,164).

Claim 7 has been significantly amended. A new ground of rejection therefore is necessitated by the amendment and is set forth as follows.

Waitts teaches a *graphical material,* serves as the single layer or multiple layer, that is comprised of *holographic area* (12, Figure 2, or 312, Figure 4) for reconstructing *three-dimensional object* (such as 18, 20 and 22) and *diffraction grating area* (26 Figure 2 or 326, Figure 4) for reconstructing *two-*

dimensional color pattern such as logo or trademark. The holographic area and the diffraction grating area are *superimposed* to each other, (please see Figure 4). Waitts also teaches explicitly that he reconstructed *image* of three-dimensional object and the reconstructed *image* of two dimensional color pattern such as logo or trademark are superimposed or with overlapping *appearance*, (please see column 2, lines 30-34). Both the hologram and the diffraction grating are reconstructably recorded such that they each are reconstructed to display hologram image of the 3D object or the 2D logo or trademark. Waitts teaches that the hologram is visible light hologram, which means it is colored. The 2D logo image recorded within the diffraction grating also has color patter such as *rainbow.* Waitts further teaches that it is commonly known in the art that diffraction gratings may be produced optically by the *interference pattern* of a *plurality of intersecting beams*, which known in the art as *holographically*, (please see column 1, lines 65-67). This means the diffraction gratings that have the 2D or plane graphic information are also *holographic* elements. Waitts teaches that the holograms for the 3D object and the holographically recorded diffraction gratings for the 2D graphic information may be recorded in the same recording medium, (please see Figure 2).

This reference therefore has anticipated the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 8-9, 11-14 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Waitts in view of the patents issued to Cowan and Wreede et al (PN. 5,499,118).

Waitts teaches a *graphical material* that is comprised of *holographic area* (312, Figure 4) for reconstructing three-dimensional object (such as 18, 20 and 22) and *diffraction grating area* (326, Figure 4) for reconstructing two-dimensional color pattern such as logo or trademark. The holographic area and the diffraction grating area are *superimposed* to each other, (please see Figure 4). Both the hologram and the diffraction grating are reconstructably recorded such that they each are reconstructed to display hologram image of the 3D object or the 2D logo or trademark. Waitts teaches that the hologram is visible light hologram, which means it is colored. The 2D logo image recorded within the diffraction grating also has color patter such as rainbow. Waitts further teaches that it is commonly known in the art that diffraction gratings may be produced optically by the interference pattern of a plurality of intersecting beams, which known in the art as holographically, (please see column 1, lines 65-67). This means the diffraction gratings that have the 2D or plane graphic information are also holographic elements. Waitts teaches that the holograms for the 3D object and the holographically recorded diffraction gratings for the 2D graphic information may be recorded in the same recording medium. It is implicitly true that holographic recording involves recording interference patterns of the 3D object and the 2D graphic information modulated light beam with a reference beam.

With regard to the features concerning using hologram plate to record the graphical information, the process of recording a *master* hologram or hologram plate and then use the reconstructed image light from the master hologram to create the object beam for recording or copying a hologram is an extremely well-known process in the art. This is demonstrated by the teachings of **Cowan**. **Cowan** teaches to record a *reflection type master hologram* by placing the object (100, Figure 9) at the opposite side of the recording medium (115). The reference light (120) reflected off the object is interfered with the incident reference beam to create interference fringe patterns therefore hologram within the recording medium. The master hologram (150) is then placed at the backside of the recording plate (190, Figure 13) to be reconstructed by using incident reference light beam to create the object beam to interfere with the

reference beam to record the hologram within the recording plate. **Wreede** et al in the same field of endeavor also teaches to use **two** master holograms (such as 25 and 29, in Figure 1) to create two object light beams to be recorded in a single recording medium, (35). The two master holograms are placed with a space interposed between each other and with one placed in front of the other, which will be able to allow the holograms recorded to reproduce hologram images at different spatial locations or depth. It would then have been obvious to one skilled in the art to apply the teachings of Cowan and Wreede et al to use the two-step method for creating hologram plates and then reconstructing the hologram plate for recording both the holographic area and the holographically recorded diffraction area for the benefit of providing an alternative and standard process to create the graphic materials, such that the reconstructed images could have different spatial locations as desired.

9. **Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Waitts, Cowan and Wreede et al as applied to claim 8 above, and further in view of the patent application of Nishikawa et al (US 2001/0053004).**

The graphical materials having holograms for creating 3D object image and holographically-recorded diffraction gratings for creating 2D logos or trademark as taught by **Waitts** in view of the teachings of **Cowan** and **Wreede** et al as applied for claim 8 above have met all the limitations of the claim with the exception that they do not teach explicitly about the deactivation of the recording medium and recording hologram with scatter plate. **Nishikawa** et al in the same field of endeavor teaches to record a reflection type hologram with a *diffusion* plate. Nishikawa et al also teaches that certain areas of the recording medium can be deactivated in order to stabilize the recorded hologram, (please see Figures 1 and 32). It would then have been obvious to one skilled in the art to apply the teachings of Nishikawa et al to modify the graphical materials of Waitts for the benefit of using a recorded diffusing plate to

create more uniformly distributed image light and to stabilize the recorded holograms within the recording medium.

Response to Arguments

10. Applicant's arguments filed on June 24, 2004 have been fully considered but they are not persuasive. The newly amended claims and newly submitted claim have been fully considered and they are rejected or objected for the reasons stated above.

11. In response to applicant's arguments which state that cited Waitts teaches that a diffraction grating can be made *by intersecting light beams* but it is not the same as "exposing said color pattern of plane character to light and recording the interference pattern thereof in the same photosensitive material" the examiner respectfully disagrees for the reasons stated below. Firstly, it is known in the art that a diffraction grating can be recorded *holographically* which means an interference pattern between intersecting light beams is recorded as explicitly taught by Waitts. In order to record the diffraction grating holographically namely with intersecting light beams, one of the light beam **has to be** imparted or **exposed, (the same exposure as in the instant application),** with an signal information, (in this case the two dimensional logo or trademark), so that the logo or trademark can be reconstructably recorded. The applicant is also respectfully directed to Figure 2 of Waitts wherein the holographic pattern for reconstructing the three-dimensional object (12, 14) and the diffraction grating pattern for reconstructing the two dimensional logo or rainbow image (26) are being recorded in the *same recording layer.*

12. In response to applicant's arguments which states that none of the cited references uses two holographic plates as the master holograms to record the three-dimensional object and the two-dimensional pattern of plane pattern, the examiner respectfully disagrees and wishes to indicate that using multiple mater holographic plates to record holograms simultaneously is explicitly taught in **Wreede** et al. Also the holographic recording technique that utilizes a master hologram or a plurality of master holograms is rather standard practice in the art.

Allowable Subject Matter

13. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references none has disclosed a color hologram display that is comprised of a ***reflection type volume hologram*** wherein the hologram comprises a *color pattern of plane characters or images* and a *color three-dimensional subject image* recorded in a **single** photosensitive material with the reconstructed images of the color pattern and its plane shadow changes as the observation depth varies from the surface of the holographic display wherein the plane shadow of the color patterns or images is holographically recorded in the photosensitive material such that the ***reconstructed image plane*** of the plane shadow is different from the reconstruction image plane of the color pattern.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A. Chang, Ph.D.